

repeating the simulating the bit drilling; and  
repeating the adjusting and simulating until a rate of penetration of the bit through the selected earth formation is maximized.

24

25. (Amended) A method for optimizing a design of a roller cone drill bit, comprising:  
simulating the bit drilling through a selected earth formation;  
adjusting at least one design parameter of the bit;  
repeating the simulating the bit drilling; and  
repeating the adjusting and simulating until an axial force on the bit is substantially balanced between the roller cones.

25

26. (Amended) A method for optimizing a design of a roller cone drill bit, comprising:  
simulating the bit drilling through a selected earth formation;  
adjusting at least one design parameter of the bit;  
repeating the simulating the bit drilling; and  
repeating the adjusting and simulating until a volume of formation cut by the bit is substantially balanced between the roller cones.

26

27. (Amended) A method for optimizing a design of a roller cone drill bit, comprising:  
simulating the bit drilling through a selected earth formation;  
adjusting at least one design parameter of the bit;  
repeating the simulating the bit drilling; and  
repeating the adjusting and simulating until an optimized design is determined, wherein  
the simulating comprises:  
selecting bit design parameters;  
selecting drilling parameters;  
selecting an earth formation to be represented as drilled;  
calculating from the selected parameters and the formation, parameters for a crater formed when one of a plurality of cutting elements on the bit contacts the earth formation, the cutting elements having known geometry;